

① 1, 5, 9, 13 ② $\frac{3}{2}, \frac{5}{4}, \frac{7}{6}, \frac{9}{8}$ ③ $1, -\frac{1}{4}, \frac{1}{6}, -\frac{1}{8}$

④ $a_4 = 15$ ⑤ $a_{200} = \frac{2(200) + 1}{2(200)} = \frac{401}{400}$

⑥ $1 + 4 + 9 + 16 + 25 + 36 = 55$ ⑦ -2, 4, -8, 16

$S_n = \frac{-2(1 - (-2)^n)}{1 - (-2)} = \frac{-2(1 - 16)}{3} = \frac{-2(-15)}{3} = 10$

⑧ $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$

⑨ $a_n = 4 + (n-1) = 4 + n - 1 = n + 3$

$\frac{\frac{1}{2}(1 - (\frac{1}{2})^n)}{1 - \frac{1}{2}} = \frac{\frac{1}{2}(1 - \frac{1}{16})}{\frac{1}{2}} = \frac{15}{16}$

⑩ $a_n = -3 + (n-1)(-3) = -3 - 3n + 3 = -3n$ ⑪ $a_n = -2(-2)^{n-1} = (-2)^n$

⑫ $\frac{4}{3} - \frac{8}{5} + \frac{16}{7} - \frac{32}{9}$ ⑬ arith $d = -5$ ⑭ geo $r = -2$
-26, -31

⑮ neither ⑯ geo $r = \frac{1}{3}$ ⑰ neither ⑱ geo $r = 1$ or arith $d = 0$
 $\frac{1}{54}, \frac{1}{162}, \frac{1}{64}, 32$

⑲ arith $d = -0.5$ ⑳ geo $r = \frac{1}{2}$
5.5, 5

㉑ $a_2 = 11$ ㉒ $a_2 = -5$ ㉓ $a_2 = 2 + (21-1)4 = 82$ ㉔ $a_{31} = 2 + (31-1)4 = 122$
 $S_{31} = \frac{(2 + 122)(31)}{2} = 1922$

$$(24) a_{15} = 8 + (15-1)(-10)$$

$$a_{15} = -132$$

$$a_{23} = 8 + (23-1)(-10)$$

$$= -212$$

$$S_{23} = \frac{(8-212)23}{2} = -2346$$

$$(25) S_{20} = \frac{(8+75)20}{2}$$

$$= 930$$

$$(26) S_{30} = \frac{(203+261)30}{2} = 6960$$

$$(27) a_2 = -16$$

$$a_3 = 8$$

$$a_4 = -4$$

$$(28)$$

$$S_7 = \frac{3(1-3^7)}{1-3}$$

$$= \frac{3(1-2187)}{-2}$$

$$= 3279$$

$$(29) a_{12} = 240(1.06)^{12-1}$$

$$a_{12} \approx 455.59$$

$$(30) \frac{300}{100} = \frac{100(r)^{10-1}}{100}$$

$$(31) S_{10} = \frac{8000(1-4^{10})}{1-4}$$

$$S_{10} = \frac{8000}{1-4}$$

$$\sqrt[10]{3} = r^9$$

$$r \approx 1.13$$

$$S_{10} \approx 13331.94$$

$$S_{\infty} \approx 13,333.33$$

$$(32) S_{50} = \frac{(-1+97)50}{2}$$

$$(33) S_8 = \frac{2(1-2^8)}{1-2}$$

$$= \frac{2(1-256)}{1-2}$$

$$= 510$$

$$= 2400$$

$$(34) \frac{16}{S_6} = \frac{16 \cdot \frac{4}{3}}{\frac{1}{\frac{3}{4}}} = \frac{64}{\frac{3}{4}}$$

$$(35) \text{no sum}$$

$$(36) 24 + 26 + \dots + 96$$

$$96 = 24 + (n-1)2$$

$$72 = 2n - 2$$

$$74 = 2n$$

$$n = 37$$

$$(37) a_1 = 300 + 0.15(5400) = 381$$

$$a_2 = 300 + 0.15(5019) = 375.29$$

$$r = .985$$

$$S_{18} = \frac{381(1-.985^{18})}{1-.985}$$

$$= \$6049.78$$

$$= 2220$$